AMENDMENT

Please amend the subject application as follows:

IN THE CLAIMS:

1. (Previously presented) Protein with beta-sheet structure, wherein amino acids exposed on a surface of at least two β-strands exposed on a surface of at least one beta sheet exposed on a surface of the protein are mutagenized, wherein the mutagenizing is selected from the group consisting of an insertion, a deletion, a substitution, and combinations thereof, such that the protein has a new property, wherein the new property is selected from the group consisting of an antigen binding specificity, a catalytic activity, and a fluorescence property.

2. (Previously presented) Protein according to Claim 1, wherein the protein to be mutagenized is selected from the group consisting of a crystalline, a spheruline, a heat shock protein, a cold shock protein, a β-helix protein, a lipocalin, a serpin, a fibronectin, a transcription factor, a green fluorescent protein (GFP), a nerve growth factor (NGF), a tendamistat, and a lysozyme.

3. (Previously presented) Protein according to Claim 1, wherein amino acids exposed on the surface of three beta strands exposed on the surface of the protein are mutagenized.

4. (Previously presented) Protein according to Claim 1, wherein amino acids exposed on the surface of at least four beta strands exposed on the surface are mutagenized.

5. (Previously presented) Protein according to claim 1, wherein amino acids exposed on the surface of at least two beta strands of at least two beta sheets are mutagenized.

6. (Previously presented) Protein according to claim 1, wherein amino acids exposed on the surface of three beta strands of two antiparallel beta sheets are mutagenized.

7. (Previously presented) Protein according to claim 1, wherein the protein is a vertebrate crystalline.

8. (Previously presented) Protein according to claim 1, wherein the protein is selected from the group consisting of an alpha-crystalline, a beta-crystalline, and a gamma-crystalline.

9. (Previously presented) Protein according to claim 1, wherein the protein is a gamma-II-crystalline.

10. (Previously presented) Protein according to claim 1, wherein an amino acid exposed on the surface of the protein is mutagenized in a region of the beta sheet that is accessible to a solvent.

11. (Previously presented) Protein according to claim 1, wherein an amino acid exposed on the surface is mutagenized in a region of the protein selected from the group consisting of a β-sheet structure of a domain of the protein and a β-sheet structure of a subunit of the protein.

12. (Previously presented) Protein according to claim 9, wherein at least one of the amino acids Lys 2, Thr 4, Tyr 6, Cys 15, Glu 17, Ser 19, Arg 36 and Asp 38 of a bovine gamma-II-crystalline is mutagenized.

13. (Previously presented) Protein according to claim 1, wherein an amino acid exposed on the surface of the protein is mutagenized in the beta sheet such that the protein has a new property, wherein the new property is selected from the group consisting of an antigen binding specificity and a catalytic activity.

14. (Previously presented) Protein according to Claim 13, wherein the new property is an antigen binding specificity for a compound selected from the group consisting of estradiol and BSA-β-estradiol-17-hemisuccinate.

15. (Previously presented) Protein according to claim 1, wherein the protein has binding specificity for a compound selected from the group consisting of estradiol and BSA-β-estradiol-17-hemisuccinate, and wherein the protein has an amino acid sequence comprising one of SEQ ID NO: 19 and SEQ ID NO: 21.

16. (Previously presented) A composition comprising a protein according to claim 1 and at least one other protein or non-protein substance.

17. (Previously Amended) DNA coding for a protein according to claim 1.

18. (Original) RNA derived from the DNA according to claim 17.

19. (Cancelled)

20. (Previously presented) Method for preparing the protein of claim 1, the method comprising:

(a) mutagenizing a DNA coding for a protein with beta-sheet structure in those regions which code for at least two beta strands, exposed on the surface, of a beta sheet exposed on the surface;

(b) expressing the DNA obtained in step (a) in an expression system to produce a protein encoded by the expressed DNA;

(c) selecting a protein encoded by the expressed DNA having a desired property; and

(d) isolating the protein encoded by the expressed DNA having the desired property.

21. (Previously presented) Method according to Claim 20, wherein the mutagenizing comprises a site-specific substitution in the beta sheet.

22. (Previously presented) Method according to claim 20, wherein the expressing is in a system selected from the group consisting of a prokaryotic cell, a eukaryotic cell, and a cell-free system.

23. (Previously presented) Method according to claim 20, further comprising identifying a protein having a desired property by contacting the protein with a binding partner, wherein the binding of the protein to the binding partner identifies the protein as having the desired property.

24. (Previously presented) Method according to claim 20, wherein the desired property of the protein is a catalytic activity and wherein identifying the protein having a desired catalytic activity comprises contacting the protein encoded by the expressed DNA with a substrate, wherein the binding of the protein encoded by the expressed DNA to the substrate identifies the protein encoded by the expressed DNA as having the desired catalytic activity.

25. (Previously presented) A method of preparing a composition for use in an application selected from the group consisting of diagnostics, therapy, cosmetics, bioseparation, biosensors, and reducing harmful substances, the method comprising:

(a) providing a protein according to claim 1; and

(b) preparing a composition for use in an application selected from the group consisting of diagnostics, therapy, cosmetics, bioseparation, biosensors, and reducing harmful substances by incorporating therein the protein according to claim 1.

26. (Currently amended) Protein according to claim 7, wherein the vertebrate is selected from the group consisting of a bovine, a rodent, a bird, and a fish.

27. (Previously presented) Protein according to claim 1, wherein an amino acid exposed on the surface of the protein is mutagenized in a region of the beta sheet that is accessible to a binding partner.

28. (Previously presented) Protein according to claim 1, wherein an amino acid exposed on the surface is mutagenized in a β-sheet structure of a subunit of the protein.

29. (Previously presented) The method of claim 20, further comprising purifying the protein encoded by the expressed DNA.

30. (Previously presented) The method of claim 20, wherein the expressing is on the surface of an entity selected from the group consisting of a plant cell, an animal cell, a yeast cell, a virus, and a bacterium.

31. (Previously presented) The method according to Claim 20, wherein the mutagenizing comprises a site-specific deletion in the beta sheet.

32. (New) The method according to Claim 20, wherein the mutagenizing comprises a site-specific insertion in the beta sheet.

33. (Previously presented) The method according to Claim 20, wherein the mutagenizing comprises a random substitution in the beta sheet.

34. (Previously presented) The method according to Claim 20, wherein the mutagenizing comprises a random deletion in the beta sheet.

35. (Previously presented) The method according to Claim 20, wherein the mutagenizing comprises a random insertion in the beta sheet.

36. (Previously presented) A vector comprising the DNA of claim 17.

37. (Previously presented) The vector of claim 36, wherein the vector is a prokaryotic vector.

38. (Previously presented) The vector of claim 36, wherein the vector is a eukaryotic vector.

39. (Previously presented) The vector of claim 36, wherein the DNA has a nucleotide sequence that encodes a protein having an amino acid sequence that is one of SEQ ID NO: 19 and SEQ ID NO: 21.

40. (Previously presented) A cell comprising the DNA of claim 17.

41. (Previously presented) The cell of claim 40, wherein the DNA has a nucleotide sequence that encodes a protein having an amino acid sequence that is one of SEQ ID NO: 19 and SEQ ID NO: 21.

42. (Previously presented) A mutagenized gamma crystalline polypeptide, wherein the mutagenizing is selected from the group consisting of an insertion, a deletion, a substitution, and combinations thereof, such that the gamma crystalline polypeptide has a new binding property.

43. (Previously presented) A method for preparing a gamma crystalline protein with a new binding property, the method comprising mutagenizing a gamma crystalline polypeptide, wherein the mutagenizing is selected from the group consisting of an insertion, a deletion, a substitution and combinations thereof, to provide a mutagenized gamma crystalline protein with a new binding property.

44. (Previously presented) A method of preparing a protein with a new binding property, the method comprising:

(a) mutagenizing a gamma crystalline protein to provide a gamma crystalline protein with a new binding property; and

(b) combining the mutagenized gamma crystalline protein with another protein to provide a protein with a new binding property.

45. (Previously presented) The method according to claim 44, wherein the mutagenizing is selected from the group consisting of an insertion, a deletion, a substitution and combinations thereof.